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URBANISATION OF SPACE – BEGINNING OF A TOWN

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Pometeno pod preprogo:
zbir živalskih ostankov na pragu
rimske kolonije Emone

Swept under the carpet:
Animal remains on the doorstep of the
Roman town of Emona (Slovenia)

Borut Toškan

Izvleček: V prispevku so predstavljeni rezultati analize živalskih ostankov s treh rimskodobnih (časovni okvir: 1. do 4. stoletje) najdišč z območja Emone: Tobačna mesto, Vrtača 8 in Mirje 13. Ob številnih pričakovanih ugotovitvah (npr. večinska zastopanost goveda, odsotnost lovnih vrst, nizka klavna starost prašičev v nasprotju s precej višjo pri govedu in drobnici, prevlada domačih živali naprednih rimskega pasem) analizirano gradivo izstopa po visokem, nad 30-odstotnem deležu konja. Glede na lego treh najdišč onkraj urbaniziranega dela rimske Emone je bilo predlagano, da so prebivalci mesta sem odlagali ostanke kulinarično nezanimivih živali (konji, obolelo govedo).

Ključne besede: rimska doba, Emona, arheozoologija, konj, govedo

Abstract: The contribution discusses the animal remains from three Roman-period (1st–4th century) sites at the Roman town of Emona: Tobačna mesto, Vrtača 8 and Mirje 13. The analysis brought a number of results that had been anticipated (such as the leading role of cattle, absence of hunted animals, pigs slaughtered at a very young age as opposed to the considerably higher age of cattle and ovicaprids, predominance of domesticated species of improved Roman breeds), but also a surprisingly high, over 30% share of horse remains. Considering the location of the three sites, outside the town walls, it is suggested that these sites were where the town dwellers discarded the remains of the culinarily uninteresting animals (horses, cattle that died/were slaughtered because of illness).

Keywords: Roman period, Emona, archaeozoology, horse, cattle

Uvod

Poleti 1875 so domačini pri kopanju jarka ob Ižanski cesti med vasjo Studenec (današnji Ig) in Ljubljano naleteli na ostaline prazgodovinskih kolišč. Te so na pobudo Dragotina Dežmana, tedanjega kustosa deželnega muzeja v Ljubljani, že čez nekaj dni postale predmet ene prvih uradnih arheoloških raziskav na Slovenskem.¹ Zbrano gradivo je Dežman tudi analiziral (in objavil).² Pozornost je, ob stari lončenini in kamnitih najdbah, namenil tudi živalskim ostankom, s čimer je poskrbel za premierno vključitev arheozoološke raziskave pri nas. Tovrstnega sodelovanja je bilo v naslednjih desetletjih še veliko, vendar večinoma v okviru raziskav starejših kamenodobnih in bakrenodobnih najdišč.³ Rimskodobni konteksti, ki so v tem prostoru v arheološkem smislu sicer nedvomno med najbolj intenzivno raziskovalnimi,⁴ so pozornost arheozoologov začenjali pritegovati šele od sredine osemdesetih let.⁵ Odtej se je tovrstnih objav nekaj vendarle nabralo, večinoma pa obravnavajo podeželska in manjša urbana naselja s pripadajočimi grobišči.⁶ Izmed štirih avtonomnih mest z območja današnje Slovenije je daleč največ podatkov na voljo za Emono. Pojavlajo se kot krajski zaznamki v starejši literaturi,⁷ kopica neobjavljenih poročil⁸ in posamezni objavljeni znanstveni članki,⁹ ki skoraj brez izjeme obravnavajo gradivo iz notranjosti obzidanega mesta ali iz njegovih še vedno urbaniziranih predmestij. Naše vedenje o živalskih ostankih z območja agrarno izkoriščane okolice je posledično zelo skopo,¹⁰ zato ga želimo na tem mestu vsaj nekoliko obogatiti.

Najdišča

Prispevek obravnava arheozoološko gradivo z najdišč Tobačna mesto, Vrtača 8 in Mirje 13, ki vsa ležijo na robu mestnega središča današnje Ljubljane (sl. 1). Velikost izkopnega polja se je od najdišča do najdišča zelo razlikovala (npr. 5.266 m² v Tobačna mestu v primerjavi

Introduction

In the summer of 1875, while digging a ditch along the road between the capital city of Ljubljana and the small village of Ig (the then Studenec), workers happened upon remains of prehistoric pile dwellings. Only a few days later, the curator of the Ljubljana Provincial Museum, Dragotin Dežman,¹ organized one of the first official archaeological excavations in Slovenia.² Together with pottery and stone finds, he also studied (and published) the many animal remains,³ providing for an early introduction of archaeozoological analysis into local archaeological research. Unfortunately, several generations of his successors focused on Palaeolithic and Eneolithic fauna,⁴ all but neglecting the more recent material. Even the Roman period contexts, which were⁵ and still are⁶ amongst the archaeologically most studied in the region, received true archaeozoological attention only from the mid-1980s onward.⁷ Recently, several new papers have been published, in great part dedicated to rural and smaller urban sites, including the corresponding cemeteries.⁸ Of the four Roman autonomous towns on the territory of the present-day Slovenia, by the far richest database is available for Emona. Together with some short notes in older literature⁹ and several unpublished reports,¹⁰ the few available papers¹¹ mostly deal with faunal assemblages from within the town's walls or from its suburbs. In contrast, data on the animal remains from the agrarian hinterland are almost entirely lacking (for the possibly only exception, see the short passus in Toškan¹²). To provide at least some insight into this part of the then reality, we here present three indeed small faunal assemblages, but with the advantage of having been collected on the very doorstep of the town of Emona.

The sites

This paper deals with archaeozoological material from the sites of Tobačna mesto, Vrtača 8 and Mirje 13, all bordering the centre of present-day Ljubljana (Fig. 1). The size of excavated areas differs importantly between the three sites (e.g. 5,266 m² at Tobačna mesto vs. 240 m² at Vrtača 8); however, the fieldwork techniques appear to have been similar, adhering to the established standards in local

¹ Velušček 2006, str. 17.

² Deschmann 1875; Drobne 1973, str. 218–221.

³ Glej npr. Rakovec 1973; Drobne 1973; Pohar 1997 in tam navedene vire.

⁴ Glej npr. Horvat 1999; Ciglenečki 1999; Šašel Kos, Scherrer (ur.) 2003 in tam navedene vire. Za zadnje obdobje glej še Ciglenečki, Modrijan, Milavec 2013; Horvat, Vičič Dolenc 2013; Modrijan, Milavec 2013; Gaspari 2014; Ragolič 2014; Istenič et al. (ur.) 2015; Horvat (ur.) 2016; Horvat et al. 2016.

⁵ Bartosiewicz 1986; 1999, tab. 1; Turk 1992.

⁶ Glej npr. Bavdek 2005; Toškan, Dirjec 2009; 2011; 2012; Boschin 2013; Tratnik 2014; Horvat et al. 2016.

⁷ Glej npr. Rakovec 1973, str. 260; Plesničar Gec 1972, str. 19, 28–29 itd.

⁸ Glej npr. Dirjec 1996; Toškan, Dirjec 2010; 2014.

⁹ Andrič et al. 2012; Dirjec et al. 2012; Toškan 2013; Kovač 2016.

¹⁰ Za morda edino takšno razpravo glej krajski komentar v Toškan 2013, str. 57–58.

¹¹ Dragotin Dežman, or Karl Deschmann in German.

¹² Velušček 2006, 17.

¹³ Deschmann 1875; Drobne 1973, pp. 218–221.

¹⁴ See e.g. Rakovec 1973; Drobne 1973; Pohar 1997; and references therein.

¹⁵ See e.g. Horvat 1999; Ciglenečki 1999; Šašel Kos, Scherrer (Eds.) 2003; and references therein.

¹⁶ See e.g. Ciglenečki, Modrijan, Milavec 2013; Horvat, Vičič Dolenc 2013; Modrijan, Milavec 2013; Gaspari 2014; Ragolič 2014; Istenič et al. (Eds.) 2015; Horvat (Ed.) 2016; Horvat et al. 2016..

¹⁷ Bartosiewicz 1986; 1999, tab. 1; Turk 1992.

¹⁸ See e.g. Bavdek 2005; Toškan, Dirjec 2009; 2011; 2012; Boschin 2013; Tratnik 2014; Horvat et al. 2016.

¹⁹ See e.g. Rakovec 1973, 260; Plesničar Gec 1972, pp. 19, 28–29 etc.

²⁰ See e.g. Dirjec 1996; Toškan, Dirjec 2010; 2014.

²¹ Andrič et al. 2012; Dirjec et al. 2012; Toškan 2013; Kovač 2016.

²² Toškan 2013, pp. 57–58.



Sl. 1: Lega obravnavanih najdišč na karti Ljubljane: 1 - Tobačna mesto, 2 - Vrtača 8, 3 - Mirje 13. Označen je tudi potek emonskega obrambnega zidu.
Vir: TTN 5, 2004 © GURS.

Fig. 1: Geographic location of the studied sites on the map of Ljubljana: 1 - Tobačna mesto, 2 - Vrtača 8, 3 - Mirje 13. Also shown is the course of Emona's defensive wall. Source: TTN 5, 2004 © GURS.

z zgolj 240 m² na Vrtači 8], vendar je bila metodologija izkopavanja podobna in je v vseh treh primerih sledila uveljavljenim standardom za predhodne arheološke raziskave.¹¹ V rimskem času so obravnavane lokacije ležale tik ob urbaniziranem območju Emone.

Tobačna mesto, faza 1.1

Izkopavanja na lokaciji Tobačna mesto (faza 1.1) so potekala poleti 2011. Izvedlo jih je podjetje Arhej, d. o. o., pod vodstvom Matjaža Novšaka, Sama Hvalec in Iris Bekljanov Zidanšek. Podrobnejši podatki o metodologiji in poteku izkopavanj so navedeni v neobjavljenem terenskem poročilu,¹² ki vključuje tudi preliminarno arheološko interpretacijo najdišča. Ob rimskodobnih kontekstih (tako imenovana faza 1; časovni okvir: konec 1. stol. pr. n. št.

rescue excavations.¹³ In Roman times, the studied locations lay just outside the urbanized area of the town (Fig. 1).

Tobačna mesto, Phase 1.1

The excavations at Tobačna mesto (Phase 1.1) took place in the summer of 2011. They were performed by Arhej LLC, under the leadership of Matjaž Novšak, Samo Hvalec and Iris Bekljanov Zidanšek. Detailed information regarding the fieldwork research methodology can be found in the unpublished field report,¹⁴ which also includes the preliminary archaeological interpretation of the site. Apart from the Roman period contexts of the so-called Phase 1 (end of 1st century BC to 4th century AD), Late Medieval and Post-Medieval contexts were also detected.¹⁵

The Romans used the area of Tobačna mesto for agriculture. The fields were crossed by several drainage ditches as well as by the road leading towards the Polhov Gradec hills. In addition to this,

11 Novakovič *et al.* 2007.

12 Hvalec *et al.* 2012.

13 Novakovič *et al.* 2007.

14 Hvalec *et al.* 2012.

15 Hvalec *et al.* 2012, p. 25.

do 4. stol. n. št.) so izkopavanja dala tudi ostaline iz časa poznega srednjega in novega veka.¹³

Rimljani so območje Tobačna mesta izkoriščali v agrarne namene. Polja so prečkali številni drenažni jarki ter tudi cesta proti Polhograjskemu hribovju. Nabor raziskanih arheoloških struktur vključuje še kopico (domnevno odpadnih) jam ter nekoliko plitvejši jarek z neobičajnim prečnim profilom (stratigrafska enota [= SE] 1407). Slednjega je deloma zapolnjeval odpad z domnevne bližnje ustrine.¹⁴

Vrtača 8

Območje lokacije Vrtača 8, ki leži manj kot 200 metrov vzhodno od Tobačna mesta, je bilo raziskano novembra leta 2015. Dela je izvedlo podjetje Arhej, d. o. o., pod vodstvom Matjaža Novšaka. Podatki o poteku izkopavanj in preliminarne arheološke ugotovitve so podani v neobjavljenem terenskem poročilu.¹⁵ Pretežni del arheološko zanimivih kontekstov je datiran v rimske čase (faze 3 do 7; časovni okvir: od 1. do 4. stol. n. št.), medtem ko je skupek najvišje ležečih plasti (faze 8 do 11) poznosrednjeveškega in novoveškega nastanka.¹⁶

Podobno kot v primeru Tobačna mesta so prebivalci Emone tudi na lokaciji Vrtača 8 uredili njive. Med odkrite arheološke strukture sodijo (večinoma drenažni) jarki, (odpadne) lame, lame za kote in vodni zbiralnik.

Mirje 13

Izkopavanja na Mirju 13 so potekala aprila leta 2013. Izvedlo jih je podjetje Avgusta, d. o. o., pod vodstvom Draška Josipoviča. Podrobnejši podatki o poteku raziskav so skupaj s preliminarno arheološko interpretacijo najdišča podani v neobjavljenem terenskem poročilu.¹⁷ Najstarejši odkriti arheološki konteksti sodijo v čas pozne bronaste in starejše železne dobe (faza 1), največ najdb pa je sicer iz rimskega časa (približen časovni okvir: od 1. do 4. stol. n. št.).¹⁸ Nabor izkopanih struktur vključuje del domnevno gospodarske stavbe (faza 2; čas od konca 1. stol. pr. n. št. do začetka 1. stol. n. št.), odsek emonskega obrambnega jarka, za izkop katerega je bila prej omenjena zgradba porušena (faza 3; leto 14–15 n. št.), ter do 140 centimetrov debelo ruševinsko plast (faza 4; prva polovica 1. stol. n. št.), ki je prekrivala vse rimskodobne kontekste.¹⁹ Polnilo obrambnega jarka je prav tako datirano v prvo polovico 4. stoletja, kar kaže na to, da je bilo tedaj

the excavations revealed clusters of (supposedly waste) pits and a somewhat shallower ditch with a peculiar cross-section profile (stratigraphic unit [= SU] 1407), in part filled with the waste from a supposedly nearby *ustrinæ*.¹⁶

Vrtača 8

The location of Vrtača 8, positioned less than 200 m to the east of Tobačna mesto, was excavated in November of 2015. The works were entrusted to M. Novšak and his team from Arhej LLC. Data regarding the fieldwork research methodology as well as the basic archaeological interpretation are available in the unpublished preliminary field report.¹⁷ Most archaeological contexts were dated to the Roman period (Phases 3 to 7; chronological framework: 1st to 4th century AD). The uppermost complex of layers 7 to 11 is more recent, having been deposited in the Late Middle Ages or later.¹⁸

Similarly to Tobačna mesto, the Romans used the area of Vrtača for agriculture. Archaeological features revealed by the excavations include (mostly drainage) ditches, (waste) pits, postholes and a water reservoir.

Mirje 13

The excavations at Mirje 13 took place in April of 2013. They were performed by Avgusta LLC, under the leadership of Draško Josipovič. Detailed information regarding the fieldwork research methodology can be found in the unpublished field report,¹⁹ which also includes the preliminary archaeological interpretation of the site. The earliest detected archaeological contexts were dated to the Late Bronze Age and/or Early Iron Age (Phase 1), but the preponderance of finds and structures are of Roman Age (i.e. approx. 1st to 4th century AD).²⁰ The excavated features include part of a supposedly commercial/business building (Phase 2; end of 1st century BC to beginning of 1st century AD), a section of Emona's defence ditch, for the construction of which the mentioned building has been demolished (Phase 3; 14 to 15 AD), and an up to 140 cm thick destruction layer (Phase 4; 1st half of the 4th century AD), covering all other Roman period structures.²¹ The fillings of the defence ditch are also dated to the first half of the 4th century, indicating that this was when the area was levelled with the aforementioned destruction layer.²² The studied animal remains originate from either the destruction layer itself (SU 2) or the defence ditch fillings (SU 8).

Material and methods

The studied bones and teeth were collected by hand during the excavations, with no specimen originating from eventual water-

¹³ Hvalec et al. 2012, str. 25.

¹⁴ Hvalec et al. 2012, str. 26–43.

¹⁵ Novšak et al. 2015.

¹⁶ Novšak et al. 2015, str. 9–15.

¹⁷ Josipovič et al. 2014.

¹⁸ Josipovič et al. 2014, str. 76.

¹⁹ Josipovič et al. 2014, str. 18–31.

¹⁶ Hvalec et al. 2012, pp. 26–43.

¹⁷ Novšak et al. 2015.

¹⁸ Novšak et al. 2015, p. 9–15.

¹⁹ Josipovič et al. 2014.

²⁰ Josipovič et al. 2014, p. 76.

²¹ Josipovič et al. 2014, pp. 18–31.

²² Josipovič et al. 2014, p. 75.

celotno območje izravnano z že omenjeno ruševinsko plastjo.²⁰ Analizirani živalski ostanki izvirajo bodisi iz ruševinske plasti (SE 2) bodisi iz polnila obrambnega jarka (SE 8).

Material in metode

Vse arheozoološko gradivo je bilo pobrano ročno brez kakršnega koli mokrega sejanja izkopanih sedimentov. Ker s takšno metodo vzorčenja učinkovitost zajemanja drobnih najdb ni zadovoljiva,²¹ domnevamo, da je delež zastopanosti manjših skeletnih elementov ter manjših živali nasprost vsaj do neke mere podcenjen. Pri taksonomskem opredeljevanju smo upoštevali ostanke vseh skeletnih elementov z izjemo reber ($N_z = 28$). Pri poskusu razlikovanja med ostanki ovc in koz smo upoštevali vrstno specifične morfološke lastnosti posameznih skeletnih elementov,²² medtem ko so bile v primeru divjega in domačega prašiča odločilne razlike v njihovi velikosti.²³

Količinsko zastopanost posameznih taksonov smo izrazili s številom določenih primerkov (*Number of Identified Specimens; NISP*). Pri tem smo odlomke nedvomno iste kosti oziroma istega zoba obravnavali kot en sam primerek (tj. $NISP = 1$). Metrični podatki so bili zbrani v skladu s splošno uveljavljenimi arheozoološkimi standardi,²⁴ kar velja tudi za ocene starosti posameznih živali ob zakolu/poginu.²⁵

V članku predstavljeno arheozoološko gradivo hrani Mestni muzej v Ljubljani.

Rezultati

Arheozoološko gradivo rimske starosti z najdišča Tobačna mesto vključuje 735 živalskih ostankov, tisto z Vrtača 8 približno desetkrat manj ($N = 74$), medtem ko je

sieving of the material. Being well aware that the share of small finds amongst hand collected bones and teeth can be several times lower than amongst the sieved sediments from the same archaeological contexts,²³ we assume the number of small skeletal remains in the assemblages presented here to be somewhat underrated. Of the available material, all skeletal elements were submitted for identification, with the sole exception of ribs ($N_z = 28$). Sheep and goat remains were separated on the basis of specific morphological characteristics,²⁴ while the differentiation between bones/teeth of domestic pig and wild boar took advantage of inter-species size differences.²⁵

Quantitative comparisons between taxa were based on the number of identifiable specimens (NISP). In calculating NISP, we joined the fragments that undoubtedly belong to the same bone/tooth (for example fragments of bones that were broken during excavations), and counted them as a single specimen (i.e. NISP = 1). Measurements were taken following the well-established archaeozoological guidelines.²⁶ The same holds true for the estimation of the age at death.²⁷

The presented faunal material is kept by the City Museum of Ljubljana.

Results

The archaeozoological material from Roman period contexts at Tobačna mesto, Vrtača 8 and Mirje 13 consists of 735, 74 and 21 specimens, respectively. Mammalian remains prevail, with five bone fragments of the domestic hen (*Gallus domesticus*) from Vrtača being the only exception. The share of taxonomically identified finds is relatively high (median: 28.4%; range: 24.0 to 90.5%), which is explained by the large average size of the specimens due to exclusive hand-collecting sampling.

The species composition is typical of Roman period contexts in this part of Europe.²⁸ Cattle (*Bos taurus*), horse (*Equus caballus*) and pig (*Sus domesticus*) are represented in all three studied as-

Takson / Taxon	Tobačna mesto	Vrtača 8	Mirje 13	Skupaj / Total	
				NISP	%
<i>Bos taurus</i>	115	9	6	130	58.6
<i>Equus caballus</i>	55	8	5	68	30.6
<i>B. taurus</i> / <i>E. caballus</i>	2	--	--	2	0.9
Caprinae	3 + 1*	1	--	5	2.3
<i>Sus domesticus</i>	1	3	7	11	5.0
<i>Canis familiaris</i>	--	--	1	1	0.5
<i>Gallus domesticus</i>	--	5	--	5	2.3

Sl. 2: Taksonomsko opredeljeni živalski ostanki z najdišč Tobačna mesto (faza 1.1), Vrtača 8 in Mirje 13. Zvezdica označuje fragmentirano rožnico drobnice, ki jo je bilo mogoče opredeliti do nivoja vrste; pripisana je bila kozi (*Capra hircus*).

Fig. 2: Taxonomically identified animal remains from Tobačna mesto (Phase 1.1), Vrtača 8 and Mirje 13. The asterisk indicates a fragmented ovicaprid horn core, which allowed for the identification to the level of species; it was ascribed to a goat (*Capra hircus*).

20 Josipovič et al. 2014, str. 75.

21 Toškan 2015.

22 Boessneck, Müller, Teichert 1964.

23 Payne, Bull 1988.

24 Von den Driesch 1976.

25 Glej npr. Silver 1969; Payne 1973.

23 See e.g. Toškan, Dirjec 2004, 158–161.

24 Boessneck, Müller, Teichert 1964.

25 Payne, Bull 1988.

26 Von den Driesch 1976.

27 See e.g. Silver 1969; Payne 1973.

28 Bökonyi 1974; Riedel 1994; Toškan 2013, tab. 1.

Takson / Taxon	Drenažni jarki / Drainage ditches	Obcestni jarki / Roadside ditches	Obrambni jarek / Defensive ditch	Paleostruga / Palaeochannel	Jame / Pits	Jarek / Ditch SU 1407	Drugo / Other
<i>B. taurus</i>	3	19	6	--	76	11	15
<i>E. caballus</i>	13	29	4	14	--	--	8
Caprinae	1	--	--	--	--	2	2
<i>S. domesticus</i>	--	--	3	--	--	1	7
<i>C. familiaris</i>	--	--	--	--	--	--	1
<i>G. domesticus</i>	--	--	--	--	--	--	5

Sl. 3: Taksonomsko opredeljeni živalski ostanki z najdišč Tobačna mesto (faza 1.1), Vrtača 8 in Mirje 13 po tipu arheoloških struktur, iz katerih so bili pobrani.

Fig. 3: Taxonomically identified animal remains from Tobačna mesto (Phase 1.1), Vrtača 8 and Mirje 13 per type of archaeological feature.

bilo na Mirju 13 tovrstnih najdb izkopanih vsega skupaj le 21. Z izjemo petih kostnih odlomkov domače kokoši (*Gallus domesticus*) z lokacije Vrtača 8 smo vse najdbe pripisali sesalcem. Delež taksonomsko opredeljenih kosti in zob je sorazmerno visok (povprečje: 28,4 %; razpon: 24,0–90,5 %), kar razlagamo s prevlado razmeroma velikih odlomkov zaradi zgolj ročnega pobiranja najdb.

Vrstna sestava je skladna s sestavo večine drugih rimskevih najdišč v tem delu Evrope.²⁶ Govedo (*Bos taurus*), konj (*Equus caballus*) in prašič (*Sus domesticus*) so zastopani v gradivu z vseh treh lokacij, medtem ko drobnica na Mirju 13 manjka (sl. 2). Odsotnost ovc/koz kaže pripisati skromnemu številu najdb z omenjenega najdišča, saj je taksonomsko opredeljenih primerkov zgolj 19. Pričakovan je tudi nizek delež, pravzaprav kar popolna odsotnost divjadi, kar se lepo ujema s siceršnjo pičlo zastopanostjo teh živali v gradivu z rimskevimi najdišči pri nas.²⁷ Edina zares neobičajna ugotovitev, povezana s tukaj obravnavanim gradivom, je številnost ekvidnih najdb (skupno več kot 30 %; sl. 2). Med njimi je bilo z gotovostjo mogoče potrditi zgolj prisotnost konja.

Porazdelitev živalskih ostankov po posameznih tipih arheoloških struktur (npr. paleotla, vodni zbiralnik, jarki, jame) kaže na koncentracijo konjskih najdb v polnilnih drenažnih, obcestnih in obrambnega jarka (sl. 3). Pri tem lahko za vsaj nekatere od teh skupkov (koncentracij) utemeljeno domnevamo, da jih sestavljajo kosti in/ali zobje ene (iste) živali (sl. 5). Zanimiva je tudi ugotovitev, da so dolge kosti konj bistveno manj fragmentirane od, denimo, govejih ali prašičjih (sl. 4). Izmed skupno 830 analiziranih živalskih ostankov jih je sicer nepoškodovanih zgolj 76, med katerimi seveda močno prevladujejo zobje (N = 70). Prav zobje so tudi najbolje zastopan skeletni element; upoštevajoč vsa tri najdišča znaša njihov delež v povprečju kar 38,7 odstotka (razpon: od 23,1 do 47,0 %).

V okviru analize horizontalne porazdelitve živalskih ostankov je treba omeniti tudi dva skoraj popolna skeleta



Sl. 4: Ostanki konja (levo; odlomek goljenice in stopalnice) in goveda (desno; odlomek lopatice, komolčnice in stopalnice) z najdišča Vrtača 8. Opazna je razlika v stopnji fragmentiranosti. Opozorilo: konjska stopalnica je bila razbita med izkopavanji.

Fig. 4: Horse (left; tibia and metatarsal bone fragments) and cattle (right; scapula, ulna and metatarsal bone fragment) remains from Vrtača 8. Note the different level of fragmentation. The horse metatarsal bone has been broken during excavations.

semblages, while ovicaprids (Caprinae) have been found in two of them (Fig. 2). The lack of the latter in the material from Mirje is almost certainly linkable to small sample size (NISP = 19). The complete absence of wild animals, in contrast, is in line with the general scarcity of such finds in Roman period contexts.²⁹ The only truly atypical finding regarding species representation data is the relative abundance of equines (>30 % in the pooled sample; Fig. 2), amongst which only horse remains have been reliably identified.

26 Bökonyi 1974; Riedel 1994; Toškan 2013, tab. 1.

27 Toškan 2013, str. 42.

29 Toškan 2013, p. 42.

goveda z najdišča Tobačna mesto (SE 1502 in 1505). Eden je bil najden na dnu odpadne jame, drugi na dnu drenažnega jarka. Kosti in zobje, ki ju sestavljajo, predstavljajo kar 57 odstotkov vseh govejih najdb z omenjenega najdišča (sl. 5). Na podlagi zbranih metričnih podatkov (glej prilogo) ter ugotovitev o stopnji obrabe žvekalne površine zob in zraščenosti epifiz kaže, da je prvi skelet pripadal odrasli kravi tradicionalne lokalne forme, drugi pa subadultnemu (tj. med 24 in 42 mesecev staremu) biku/volu napredne rimske pasme.

The distribution of the analysed animal finds within individual type of archaeological features (e.g. palaeosurface, water reservoir, ditches, holes) shows horse remains to be somewhat concentrated within the fillings of drainage, roadside and defensive ditches (Fig. 3). At least some of these concentrations are due to several remains belonging to a single animal (Fig. 5). It has been observed that horse's long bones tend to be less fragmented than analogous skeletal elements in other species (Fig. 4). Cumulatively, the analysed material includes few whole, undamaged remains (i.e. 76 out of a total of 830). Not surprisingly, most of them are teeth (N = 70).

Sk. element	<i>Bos taurus</i>			<i>Equus caballus</i>			
	Okostje 1 / Skeleton 1	Okostje 2 / Skeleton 2	Skupaj / Total	Lobanja 1 / Skull 1	Lobanja 2 / Skull 2	Okostje 3 / Skeleton 3	Skupaj / Total
Mandibula	1	1	11	1/-	--	--	1
Dentes sup.	3/4	--	15	--	5/6	4/6	15
Dentes inf.	3/1	--	15	6/6	--/1	--	22
Vertebrae	10	--	10	--	--	--	--
Scapula	1/1	--	2	--	--	--	--
Humerus	1/1	--/1	5	--	--	1/1	4
Radius	1/1	--/1	5	--	--	--	--
Ulna	1/--	--/1	3	--	--	--	--
Metacarpalia	1/--	--/1	3	--	--	--	1
Carpalia	1/1	1/--	4	--	--	--	--
Ossa coxae	1/1	1/--	3	--	--	--	--
Femur	1/1	--/1	9	--	--	--	1
Tibia	1/1	--	4	--	--	1/1	6
Patella	1/1	--	2	--	--	--	--
Metatarsalia	1/--	--/1	5	--	--	1/--	3
Astragalus	1/1	--	2	--	--	--	1
Calcaneus	1/1	1/1	4	--	--	--	--
Tarsalia	1/--	1/1	6	--	--	--	--
Phalanges	2	2	5	--	--	1	1
Metapodia [indet.]	1	--	2	--	--	16	--

Sl. 5: Zastopanost posameznih skeletnih elementov goveda in konja v arheozoološkem gradivu z najdišča Tobačna mesto (faza 1.1). Ločeno so prikazani podatki za dva skoraj popolno ohranjena goveja skeleta (SE 1502 in 1505), dve konjski lobanji ter delno ohranjen konjski skelet. Podatke o številu levih in desnih primerkov posameznega skeletnega elementa ločuje poševnica (/). Seznam mikronajdiščnih podatkov za posamezne od naštetih posebnih najdb: skelet 1 (= SE 1502) – dno odpadne jame SE 1499, kvadrant H20; skelet 2 (= SE 1505) – dno obcestnega jarka SE 1484, kvadrant D16; lobanja 1 – polnilo (SE 1483) obcestnega jarka SE 1434, kvadrant E14; lobanja 2 – polnilo (SE 1473) obcestnega jarka SE 1484, kvadrant E16; skelet 3 – polnilo (SE 1473) paleostruge SE 1453, kvadrant G20.

Fig. 5: Representation of individual skeletal elements of cattle and horse in the archaeozoological material from Tobačna mesto (Phase 1.1). Separately shown are the data for two almost complete cattle skeletons (SU 1502 and 1505), two horse skulls and a partially preserved horse skeleton. Remains of left and right specimens of individual skeletal elements are separated by a slash (/). Location data of finds: Skeleton 1 (= SU 1502) – the bottom of the waste pit SU 1499, square H20; Skeleton 2 (= SU 1505) – the bottom of the roadside ditch SU 1484, square D16; Skull 1 – filling (SU 1483) of the roadside ditch SU 1436, square E14; Skull 2 – filling (SU 1481) of the roadside ditch SU 1482, square E16; Skeleton 3 – filling (SU 1473) of the palaeochannel SU 1456, square G20.

Z najdišča Tobačna mesto kaže omeniti še eno zanimivost, in sicer neobičajno koncentracijo živalskih zobnih in kostnih drobcev v polnilih jarka SE 1407 [tj. SE 1406, 1424 in 1425]. Vsi brez izjeme so namreč sežgani (kalcinirani)! Pomenljivo: takšni najdbi sta bili na vseh drugih delih najdišča odkriti le še dve. Izmed 73 ostankov iz SE 1407 jih je bilo zaradi izrazite fragmentiranosti taksonomsko mogoče opredeliti le 14. Pripisani so bili govedu, prašiču in drobnici (sl. 3).

The latter are also by far the best represented skeletal element in the analysed material, with their share being 38.7% (range: 23.1 to 47.0%) of all taxonomically identified remains.

Noteworthy as far as the distribution of finds is concerned are also two fairly complete cattle skeletons from Tobačna mesto (SU 1502 and 1505). They were found at the bottom of a waste pit and of a drainage ditch, respectively. The two skeletons contribute 57 % of all detected cattle remains at that site (Fig. 5). According to the available metric data (see Appendix), the wear of lower check teeth

Razprava

Skrumno število zbranih živalskih najdb – nad 100 jih je bilo izkopanih le na lokaciji Tobačna mesto – močno omejuje domet arheozoološke analize. Na podlagi razpoložljivih podatkov namreč ni mogoče ustrezno nasloviti niti najbolj klasičnih problematik, kot so starostna in spolna struktura posameznih vrst, velikost živali, način razkosavanja trupel ali, denimo, vrsta in pogostnost pojavljanja patoloških sprememb na kosteh in zobe.²⁸ Kar gradivo dovoljuje je kvečjemu ugotoviti skladnost s hipotezami, ki so bile postavljene na podlagi rezultatov analiz bogatejših arheozooloških zbirov. Ena takšnih je, denimo, vztrajanje nizkoraslega lokalnega goveda v tem prostoru tudi po tem, ko se je težišče govedoreje z romanizacijo postopoma prestavilo na velike živali napredne rimske pasme.²⁹ V gradivu z lokacije Tobačna mesto je to med drugim razvidno iz metričnih podatkov tako imenovanega govejega skeleta 1, najdenega na dnu odpadne Jame SE 1499 (glej zgoraj), medtem ko na Mirju 13 isto dokazuje skoraj v celoti ohranjena (najbrž kravja) rožnica, morfološko skladna z rožnicami tradicionalnih lokalnih (»landrace«) pasem.³⁰ Prisotnost več različnih govejih form potrjuje velika variabilnost razpoložljivih metričnih podatkov, ki je ni mogoče prepričljivo razložiti zgolj s spolnim dimorfizmom (npr. primerjaj velikost skeletov 1 in 2; glej prilog). Ob govedu je bila telesna velikost okvirno ocenjena le še pri konju, ki ne kaže odstopanj od povprečja za sočasne primerke iz srednje Evrope.³¹

Skladne s pričakovanji so tudi ocene starosti ob zakolu. Ugotovljena klavna starost prašičev, katerih vzreja je bila usmerjena v prirejo mesa, je bila namreč sorazmerno nizka (tj. pod tremi leti), medtem ko je bila pri drobnici in govedu, pomembnih predvsem zaradi izkoriščanja posameznih sekundarnih proizvodov reje, precej višja.

Kaj pa ugotovitve, povezane z deležem zastopanosti posameznih vrst? Vodilno vlogo goveda je treba označiti kot povsem pričakovano,³² kar tretjinska zastopanost konja pa – kot že omenjeno – močno odstopa od vrednosti s katerega koli drugega rimskega najdišča na Slovenskem.³³ Enako velja za pičlost ostankov prašiča in drobnice (tj. 5,0 oz. 3,3 %), ki običajno z nekajkrat višjimi vrednostmi suvereno sledijo vodilnemu govedu kot drugi oziroma tretji najbolje zastopani takson v gradivu. Upoštevajoč arheološke strukture, iz katerih analizirane živalske kosti in zobje s tukaj obravnavanih najdišč izvirajo (tj.

and epiphyseal fusion data, Skeleton 1 belonged to an adult cow of the traditional local form and Skeleton 2 to a subadult (i.e. between 24 and 42 months old) ox/bull of the improved Roman breed.

Finally, we here mention a peculiar concentration of teeth and bone fragments from the fillings of the ditch SU 1407 (i.e. SU 1406, 1424, 1425), again at Tobačna mesto. Out of 73 remains, no more than 14 allowed for the taxonomical identification. The list of recorded taxa includes cattle, pig and ovicaprids (Fig. 3). Apart from the unusually high species richness of the mentioned subsample relative to the material presented here in general, its peculiarity lies in all of the fragments being burned (calcinated). Elsewhere within the same site, no more than two such specimens have been detected.

Discussion

The small size of the analysed samples, with only one of them comprising more than 100 taxonomically identified remains, precluded the possibility of effectively addressing most classic archaeozoological topics, including age at death, sex ratio, body size, butchering techniques and the incidence of pathological formations of the bones.³⁰ At most, the available data corroborate some of the already well-known facts, such as is the persistence (albeit apparently limited) of small, traditional local cattle forms also after the Romans introduced the larger improved breed(s).³¹ The latter is evident not only from the characteristics of the so-called Skeleton 1, found on the bottom of the waste pit SU 1499 at Tobačna mesto (see above), but also from the presence of an almost complete (apparently cow's) horn core, morphologically compatible with the Landrace breed³² at Mirje 13. Moreover, the available metric data for cattle are much too heterogeneous for the variability to be attributable to sexual size dimorphism (e.g. compare the size of Skeletons 1 and 2; see Appendix). The only other species with sufficient data available to assess body size is the horse, with the specimens from Emona perfectly conforming to the average of coeval horses from Central Europe.³³

Also in line with the expectations are the results regarding the age at death. Pigs, which are known to have been primarily kept as a source of meat and fats, were slaughtered at a relatively young age (i.e. under three years). In contrast, the husbandry of sheep/goat and cattle – aimed at exploiting various secondary products – prompted the farmers to keep the animals until a much older age.

What about the representation of individual species? The leading role of cattle is not surprising;³⁴ however, the over 30 percent share of horse remains is yet unprecedented for Roman period sites from the territory of the present-day Slovenia.³⁵ The same holds true for the scarce number of pig and ovicaprid remains (i.e. 5.0 and 2.3%, respectively), since they usually sport double-digit shares each,

²⁸ Davis 1987, str. 46.

²⁹ Boschin, Toškan 2012; Toškan 2013, str. 45–46, 59.

³⁰ Sensu Riedel 1979.

³¹ Bökönyi 1974; 1984; Riedel 1994.

³² Toškan 2013, tab. 1.

³³ Glej npr. Toškan 2013, tab. 1; in tam navedene vire.

³⁰ Davis 1987, p. 46.

³¹ Boschin, Toškan 2012; Toškan 2013, pp. 45–46, 59.

³² Sensu Riedel 1979.

³³ Bökönyi 1974; 1984; Riedel 1994.

³⁴ Toškan 2013, tab. 1.

³⁵ See e.g. Toškan 2013, tab. 1; and references therein.

predvsem jarki in odpadne Jame), ter nadpovprečno dobro ohranjenost konjskih (dolgih) kosti (sl. 4), bi omenjene netipične deleže zastopanosti posameznih taksonov nemara lahko razložili s specifično gospodarsko vlogo konja. Gre namreč za žival, ki je bila nepogrešljiva pri transportu in vojskovjanju, ni pa bila zanimiva v kulinaricnem smislu.³⁴ Zato konjskih ostankov tudi ne kaže iskati med običajnimi kuhinjskimi ali klavniškimi odpadki, vsaj ne v večjem številu.³⁵ Prebivalci Emone – podobno lahko domnevamo tudi za prebivalce drugih tedanjih mest – so njihova trupla namesto tega večinoma odlagali zunaj urbaniziranih predelov, pri čemer so bile priročna rešitev, kot kaže, kar primestne njive.

V luč takšne možnosti ugotovljen višji delež zastopanosti klasičnih prehranskih odpadkov (tj. močno fragmentirani ostanki goveda, prašiča in drobnice) v gradivu z Vrtače 8 in Mirja 13 ni presenetljiv, saj sta ti dve lokaciji bliže območju nekdanje Emone kot Tobačna mesto. Več kot 60 kosti in zob, ki sestavljajo oba že večkrat omenjena skoraj popolnoma ohranjena goveja skeleta z najdišča Tobačna mesto, v tem smislu seveda ne predstavlja kuhinjskih/klavniških odpadkov. Ravno nasprotno! Glede na okoliščine najdbe bi oba omenjena skeleta prej kazalo pripisati bolnima in torej za prehrano neustreznima živalma, ki sta bili po zakolu odvrženi v neko dovolj odmaknjeno jamo ozziroma jarek. Pri tem ni nepomembno, da na teh kosteh niso bile opažene nikakršne sledi urezov, niti takšnih, ki bi kazali na odiranje.³⁶ Opozoriti je treba tudi na skromno stopnjo fragmentiranosti teh kosti, ki je povsem primerljiva s tisto pri konju (glej npr. sl. 4).

Pri navedeni interpretaciji vsaj na prvi pogled moti odsotnost kakršnih koli makroskopsko zaznavnih večjih sprememb na površini konjskih kosti zaradi gnitja, ki se sicer pojavi že v najzgodnejših fazah razpadanja trupla in pri katerem sodelujejo endogene bakterije in encimi.³⁷ Vendar novejše eksperimentalne študije kažejo, da je vpliv bakterijske aktivnosti na zgodnjo diagenezo kostnine manjši od predhodno domnevanega.³⁸ Poleg tega je na površini pretežnega dela kosti z lokacij Tobačna mesto in Vrtača 8 opaziti razpoke in luščenje, kar otežuje spremeljanje sledov delovanja drugih diagenetskih procesov.

Sklepni del razprave namenjamo skromnemu vzorcu sežganih kosti in zob iz jarka SE 1407 (Tobačna mesto; glej zgoraj). Živalski ostanki so bili najdeni pomešani s številnimi arheološkimi najdbami, od grobe in fine keramike do

undisputedly following cattle on the list of the best-represented taxa. Taking into account the archaeological features from which the analysed animal bone and teeth originate (i.e. mostly ditches and waste pits), as well as the significantly less pronounced fragmentation of horse (long) bones in comparison to other species (Fig. 4), such a picture seems to be linked with the specific role of horse in the Roman economy. This animal was essential in transportation and war but was seemingly not culinarily interesting.³⁶ Consequently, its carcasses were normally not discarded together with butchery and household waste, but separately.³⁷ In larger towns like Emona, such discard areas seem to have been located outside the urbanized zone, with nearby fields representing a handy solution.

If the above thesis is valid, it might not be coincidental that the share of butchery/household waste (i.e. highly fragmented cattle, pig and ovicaprid remains) happens to be higher at the two locations closer to town (i.e. Vrtača 8 and Mirje 13) relative to the more distant Tobačna mesto. Of course, in the latter case we should not count the over 60 bones/teeth of the complete cattle skeletons as kitchen waste. On the contrary, the two animals were likely killed because of being ill and were thus not used for food (noteworthy: no chop or cut marks have been observed, not even those indicating skinning)³⁸. Moreover, the aforementioned cattle bones show minimal fragmentation, typical of deposits of non-culinary character (see horse bones in Fig. 4). What is puzzling in this case – at least at first sight – is the absence of any macroscopically detectable major alteration of the bone surface due to putrefaction, even though this process has been observed to occur during the very early stages of decomposition and involves endogenous bacteria and enzymes.³⁹ Nevertheless, more recent actualistic experiments showed some assumptions that have traditionally been considered of relevance in early bone diagenesis, including decay conditions and bacterial activity, to be less important than previously believed.⁴⁰ In addition to this, most of the remains from Tobačna mesto and Vrtača exhibit some superficial cracking and flaking, which makes it difficult to observe the traces of other types of early bone diagenesis processes.

Finally, a few words need to be said regarding the small subsample of burned bones and teeth from the ditch SU 1407 at Tobačna mesto (see above). They were found mixed with great quantities of archaeological finds, including fine and coarse tableware, slag and tazzes. The latter are especially noteworthy for there are chances the Romans used them in the ritual cremation of corpses on a communal cremation site (*lustrina*) within Emona's western necropolis. However, instead of being put in the grave together with other grave goods, tazzes must have been left on the spot, only to be eventually

³⁴ MacKinnon 2004, 207.

³⁵ Bartosiewicz 2008, str. 181, 184; Toškan, Dirjec 2011, str. 307–308; Gaspari *et al.* 2014, str. 140.

³⁶ Prim. Porenta *et al.* 2015, str. 358–360.

³⁷ Jans *et al.* 2004.

³⁸ Fernández-Jalvo *et al.* 2010.

³⁶ MacKinnon 2004, 207.

³⁷ Bartosiewicz 2008, pp. 181, 184; Toškan, Dirjec 2011, pp. 307–308; Gaspari *et al.* 2014, p. 140.

³⁸ Compare to Porenta *et al.* 2015, pp. 358–360.

³⁹ Jans *et al.* 2004.

⁴⁰ Fernández-Jalvo *et al.* 2010.

oljenk in kadilnic. Slednje so se uporabljale za sežiganje dišavnic ob raznih ritualih, zato se ponuja razlaga, da so prebivalci Emone kadilnice uporabljali ob obredu sežiga preminulih svojcev na skupnem sežigališču (*ustrina*). Pri tem naj jih po koncu obreda ne bi položili v grobove z ostalimi pridatki, temveč naj bi – skupaj s sežganimi živilskimi kostmi – v jarku končale kot del procesa čiščenja skupnega sežigališča.³⁹ To domnevo podkrepljuje dejstvo, da je koncentracija najdb največja ravno v severnem delu jarka, ki je grobišču najbliže.⁴⁰

Sklep

Sorazmerno skromen nabor arheoloških najdb z najdišč Tobačna mesto, Vrtača 8 in Mirje 13 močno omejuje domet arheozoološke analize, vendar pomeni visok delež konja – v kombinaciji s pičlostjo ostankov kulinarično najzanimivejših domestikatov – pomembno in zanimivo ugotovitev. Kaže namreč na različno ravnanje tedanjih ljudi z živilskimi ostanki v odvisnosti od tega, ali gre za klavniške/kuhinjske odpadke ali za trupla kulinarično nezanimivih vrst. Slednja so, kot kaže, večinoma odlagali zunaj urbaniziranega območja, in sicer pogosto tako, da so jih preprosto zavrgli v drenažni ali obcestni jarek. Alternativna rešitev je bil zakop v (odpadno) jamo. Prav to možnost med drugim domnevamo za dve bržas oboleli govedi, ki zato nista bili primerni za prehrano (glej tako imenovana skeleta 1 in 2; sl. 5).

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removed during periodical cleaning sessions.⁴¹ Part of this material is believed to have been discarded in the abovementioned ditch SU 1407, together with cremated (animal) bone fragments. After all, the ditch was located in the eastern part of the excavation field, on the very border of Emona's western necropolis.⁴²

Conclusion

The assemblages of animal remains from Tobačna mesto, Vrtača 8 and Mirje 13 were rather small, lowering the ambitions of the archaeozoological analysis. Nevertheless, the detection of an unusually high share of horse (i.e. >30 %), combined with relatively scarcely represented cattle, sheep, goat and pig, is entirely noteworthy, offering new insights into the differential manipulation and discard of animal remains (either bones or carcasses) of culinarily interesting species relative to those that were normally not eaten. The latter were seemingly deposited outside the urbanized area, being at times evidently simply thrown in drainage or roadside ditches. Alternatively, the carcasses were buried in appositely dug pits. Not surprisingly, the same approach has been observed with two cattle specimens (SU 1502 and 1505), which supposedly died / were slaughtered because of illness and were thus not considered appropriate for consumption (see Skeletons 1 and 2; Fig. 5).

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³⁹ Hvalec *et al.* 2012, str. 137–138.

⁴⁰ Hvalec *et al.* 2012, str. 137.

⁴¹ Hvalec *et al.* 2012, pp. 137–138.

⁴² Hvalec *et al.* 2012, p. 137.

Takson / Taxon	Sk. element	Dimenzija / Dimension	Izmerki / Measurements						
<i>B. taurus</i>	Pr. cornualis	Obseg / Circumfer.	131,0						
		Ø (max.)	47,0						
		Ø (min.)	34,0						
	M ₃	Dolžina / Length	38,5	37,5	32,0	37,5	38,5	32,0a	42,0
		Širina / Breadth	15,0	14,5	14,0	14,5	15,0	14,0a	--
	Humerus	SD	33,0a						
		Bd	65,0a						
	Radius	Bp	75,0	75,0a	88,0b				
		SD	34,5	34,5a	--				
	Metacarpus	Bp	46,5	46,5a	64,0b				
		SD	29,5	29,5a	--				
		Bd	--	--	64,5b				
	Tibia	SD	33,0a						
	Calcaneus	GB	37,5						
	Metatarsus	Bp	52,0b	33,0	52,0	60,0	59,0		
		SD	--	20,0	30,0	34,0	30,0		
		Bd	55,5b	--	--	--	--		
<i>E. caballus</i>	P ₂	Dolžina / Length	32,5c	36,0d	32,0				
		Širina / Breadth	15,0c	24,0d	14,0				
	P ₃	Dolžina / Length	28,0c	30,0d					
		Širina / Breadth	16,0c	27,0d					
	P ₄	Dolžina / Length	28,0c	27,5d					
		Širina / Breadth	16,0c	26,5d					
	M ₁	Dolžina / Length	25,5c	26,0d					
		Širina / Breadth	15,0c	26,5d					
	M ₂	Dolžina / Length	25,5c	26,0d					
		Širina / Breadth	14,0c	26,0d					
	M ₃	Dolžina / Length		24,0d					
		Širina / Breadth		20,0d					
	Humerus	SD	36,0	29,0					
		Bd	77,0	65,0					
	Metacarpus	Bp	50,0						
		SD	33,5						
	Tibia	SD	37,5	41,0	--				
		Bd	--	--	68,5				
		Dd	--	--	41,5				
	Metatarsus	Bp	49,0	44,5	--				
		SD	31,0	31,0	31,0				
		Bd	--	--	46,5				
		GL	265,0	281,0	--				
<i>S. domesticus</i>	M ₁	Širina / Breadth	10,5						
	M ₂	Širina / Breadth	13,5						
	Humerus	SD	15,0						
	Tibia	SD	19,5	16,5					
		Bd	--	27,0					
		Dd	--	21,0					
<i>G. domesticus</i>	Humerus	Bd	15,0						
		Sc	7,0						
	Femur	Sc	7,0						
		Bd	15,5						
		Dd	13,0						
	Tibia	Dd	12,5						
		GL	113,0						

Priloga: Metrični podatki¹ za govedo (*B. taurus*), konja (*E. caballus*), prašiča (*S. domesticus*) in kokoš (*G. domesticus*) iz Tobačna mesto (faza 1.1; zapisano s običajno pisavo), Vrtača 8 (zapisano s krepko pisavo) in Mirje 13 (zapisano s ležečo pisavo). Meritve, ki se nanašajo na skeleta 1 in 2 ter lobanji 1 in 2 (glej sliko 5), so označene z nadpisanimi črkami a, b, c in d, respectivno.

1 Za obrazložitev kratic glej von den Driesch 1976.

Appendix: Metric data¹ for cattle (*B. taurus*), horse (*E. caballus*), pig (*S. domesticus*) and hen (*G. domesticus*) from Tobačna mesto (Phase 1.1; written in regular characters), Vrtača 8 (written in bold characters) and Mirje 13 (written in italic characters). Measurements related to Skeletons 1 and 2 and Skulls 1 and 2 (see Fig. 5) are marked with superscript letters a, b, c and d, respectively.

1 For the explanation of abbreviations see von den Driesch (1976).

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